1770

A

Phyſiological Enquiry
INTO THE
PROCESS
OF
LABOUR,

And an ATTEMPT to aſcertain

The Determining Cauſe of it.

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The Method of Teaching, which approaches moſt nearly to the Method of Inveſtigation, is incomparably the beſt.
SUBLIME and BEAUTIFUL.

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M,DCC,LXX.

T O

DAVID Mc. BRIDE, M. D.

THE following Eſſay is offered to you, Sir, rather as a Tribute of Reſpect, than for the Purpoſe of obtaining your Protection of it. You are amongſt the Number of the few, from whoſe Publications this Iſland can claim any Pretenſions to enter the Liſts for Medical Productions; there is Nobody then will doubt but you are perfectly a Judge of the Faults or Merit of this little Syſtem. The Principles of it are the Property of the ingenious Monſieur PETIT, at preſent King's Profeſſor at the Royal Garden at Paris, whoſe Panegyric would receive very little Advantage from my poor Mention of Him; I ſhould therefore grant him the Privilege of Concealment, which I beg Leave to make Uſe of myſelf, but that even in Privacy I ſhould bluſh to think I had robbed any Gentleman of his Property.

Pulchrum profiteri per quos profeceris.
CICERO.

400530

ENQUIRY

Into the PROCESS of

LABOUR, &c.

THE Queſtion of this Eſſay is of the firſt Importance, whether we conſider it as Matter of curious Inveſtigation, or with Regard to the Good it may produce to Mankind. I am very unwilling to believe it ſo much an Affair of meer Speculation as not to think that the general Practice of Midwifery will benefit, provided the Mechaniſm of this great Work be clearly and manifeſtly laid open; for I believe there is No-body ſo abſurd as to advance that Practice alone is ſufficient to entitle an Operator in the Science to the Claim of Perfection. Practice, in order to be ſolid, muſt have Precept for it's Foundation: Indeed that Precept or Theory ſhould be form'd upon Principles obtain'd from Obſervation:

I SHALL begin this Subject with a Hiſtory of natural Labour, ſhewing the Phænomena which immediately precede it, thoſe which accompany it's Progreſs, and thoſe which are obſerved to ſucceed it. If theſe Phænomena be ſuch as Practitioners generally remark, and that they are irreconcileable by any of the phyſiological Syſtems hitherto preſented, it muſt be concluded that the Syſtems have been inſufficient, and that there is ſtill Room for Enquiry; and by the Teſt of the ſame golden Rule muſt this one be approved or condemned. If I ſhould appear too minute in my Deſcription, I muſt beg Leave to remark that in natural Enquiries every Thing is intereſting; Nothing, however trivial at firſt View, which the great Goddeſs preſents is to be neglected, for it often happens that to a Circumſtance, in Appearance leaſt worthy of Attention, is finally due the Diſcovery, which had before baffled the moſt diligent and critical Reſearch. I will promiſe to avoid as much as poſſible all Hypothetical Reaſoning, endeavouring to aſcend from Effects to their true Cauſe. Theory of this Sort ſhould be ſo connected with Experience, that the Syſtem might appear as a Logical Inference drawn from premiſed Obſervation.

What LABOUR is.

LABOUR is that Operation of Nature, by Means of which a Child, quitting the Place it had occupied in it's Mother's Abdomen ſince it's firſt Formation, is produced into this World, and generally happens at the Period of nine Kalendar Months from the Conception, or in the firſt Week of the tenth. This is the common, and what is call'd the natural Period; altho' we have unqueſtionable Authority that many Women are naturally delivered in the ſeventh Month, others in the eighth, and that ſome go a conſiderable Time beyond thc tenth; how far, and at what Period we may ſtop, ſo as to aſcertain the abſolute Legitimacy of a poſthumous Child is a Queſtion of Juriſprudence, which, beſide it's being foreign to my preſent Purpoſe, would carry me beyond the

Limits I have propoſed to myſelf in this Work. A very curious Inveſtigation of it may be traced in ſome Publications at Paris in the year 1765, and 66, when the medical Gentlemen of that Univerſity were called forth on the different Sides of the Queſtion, occaſioned by an important Proceſs.

Phænomena which immediately precede LABOUR.

Some Days before Labour comes on the Belly is obſerved to ſink, and appears manifeſtly lower, ſo that in the laſt Week of Geſtation one would really imagine the Woman leſs big than ſhe had been for a Month before; and, what is more extraordinary, Women in general find themſelves lighter and more active alſo at this Time. A Perſon who had never ſearched into the Cauſes of natural Operations would be content ſilently to admire the Intention of Nature in thus reſcuing the Woman, even for a Moment, from the long Fatigue ſhe had undergone by Geſtation, the better to enable her to withſtand the grand Shock, which is to terminate the Work; but he who ſearches the Mechaniſm, by which it is brought about, hath ſtill more Reaſon to admire the Wiſdom of the Almighty Contriver of the Whole. Women who have had Children before are not at a Loſs to know that this Sun-ſhine is the Forerunner of the Storm, and they now and then find ſlight Twitches in different Parts of the Abdomen, which, tho' it be not yet real Labour, aſſures them that it is not far off.

Firſt Period of LABOUR.

THESE ſlight Pains increaſing in Violence, being of longer Duration, and leaving a ſhorter Interval of Repoſe between their Attacks, conſtitute what we ſhall call the firſt Period of Labour. The Pains however are not what the Women call the true bearing Pains; they begin in the Abdomen and ſeldom go farther; perhaps extending from the Region of the Loins they end in the umbilical Region. Between the Pains the Woman is altogether eaſy, her Spirits gay, and ſhe frequently ſleeps; the Circulation is not perceptibly quicker, there is no Increaſe of

Heat or Thirſt, nor any remarkable Change in the animal Oeconomy. The abdominal Muſcles during the Pain will be found to contract, and a gelatinous Humidity may be obſerved to eſcape from the Os externum.

Second Period of LABOUR.

THINGS proceeding in a natural Way, theſe Pains are ſucceeded by others of longer Continuance, ſharper and more violent in their Effect, whoſe Return is more frequent, but perceptibly and uniformly announced, beginning in the umbilical Region, and terminating in the lower Pelvis near the Os externum. Theſe are they which Women call the true bearing Pains, and which cauſe the greateſt Impatience. Now is the Change viſible in the animal Oeconomy; the Pulſe becomes full, rapid, and more frequent; there is univerſal Heat, a Moiſture on the Skin, the Face becomes red, the Eyes ſparkle, the Tongue and Lips are parched, the Thirſt is great and frequent, and there is univerſal Anxiety attended in general with ſlight Shivering. The abdominal Muſcles contract violently, and the Woman, by a Sort of Inſtinct, retains her Breath, thereby aiding the Expulſion with the Action of the Diaphragma, the gelatinous Liquid becomes tinged or ſtreaked with Blood, and continues to appear ſo to the End. The Os Uteri, on Examination, will be found to open, by gradual Dilatation. The circumferential Edge, from being thick, ſoft, and ſpungy, becomes thin and harder; and the Space left by the Dilatation is exactly occupied by a ſpherical Bag formed of the Membranes filled with the Liquor which ſurrounds the Fœtus. This is what the good Women call the Gathering of the Waters: The moſt ignorant female Practitioners pronounce the Birth not very diſtant, every Day's Experience ſhewing them that the Birth will be accelerated in Proportion to the Progreſs of this ſpherical Bladder. At this Time, the Orifice of the Uterus being examined, it will be found impoſſible during the Pain to perceive the Head; the Liquor of the Amnios is preſſed forward, which raiſes the Head entirely up, ſo that the Child is never ſo far from the Os Uteri as it is in the moſt violent Part of the Pain of this ſecond Period. This is a Phænomenon worthy of Attention. But, at the ſame Time that the Child contained in the Uterus is found to retire, by the Effect of each Pain, towards the Fundus Uteri, the Uterus itſelf manifeſtly deſcends into the lower Pelvis; the Diſtance between the Os internum and the Os externum is thereby conſiderably leſſened.

It muſt not be forgotten that, though the Child may have been dead a conſiderable Time before Labour came on, no Difference can be obſerved in the Nature of the Proceſs, nor is there any notable Variety between that where the Head preſents, and any other Part, ſuch as the Preſentation of the Breaſt, the Back, the Belly, Buttocks, &c.

The State between the Pains.

Between the Pains the Uterus aſcends again, but not ſo high as before the laſt Pain, ſo that each ſucceeding Pain leaves it a Degree lower in the Pelvis. The ſpherical Bladder, formed by the Liquor in the Membranes, is effaced, the Orifice of the Uterus becomes relaxed and ſoft, and it's Aperture is leſs than it was during the Pain; each Pain, however, leaves the Diameter larger than it was before, 'till at length it becomes ſufficient to admit the Child's Head. The Contraction of the Uterus ceaſing to produce it's Effect on the Liquor of the Amnios, the Child deſcends by it's own Weight; and now, the Column of Waters, which had been forced down during the Pains, no longer interfering, it may be felt at the Os internum ſo plainly, that the preſenting Part may be diſtinguiſhed from any other, notwithſtanding the Intervention of the Membranes. In this Period the Woman is perfectly in Repoſe; it is not unuſual to get a few Minutes' Sleep, which the next Pain delays not to interrupt. Here again we cannot ſufficiently admire the Intention of Providence in thus ordering the Matter: Were the whole Labour one continued State of Pain, how few would live to ſee the End of it! And, amongſt the few that might poſſibly outlive the Operation, I believe ſcarcely one would recover from the enfeebled State to which ſuch Havock muſt reduce the ſtrongeſt Conſtitution.

Third Period of LABOUR.

The third and laſt Period of Labour we ſhall fix from the Point of Time which immediately precedes the breaking of the Waters, when the Pains are exceedingly violent, yet the Women bear them more patiently than thoſe of the ſecond Period. They occupy the whole Abdomen, and end near the Anus, where they leave a Senſation, as if a Weight preſſed down there. During this Period, as well as through the Courſe of the ſecond, ſome have frequent Solicitations to urine, whilſt with others it is entirely ſuppreſſed.

At length the Bladder, formed by the Membranes in the dilated Orifice of the Uterus, becomes too full any longer to reſiſt the Force of the accumulating Fluid; it burſts with an impetuous Sound, and the Liquor of the Amnios would not fail to eſcape entirely, if the Head of the Child, no longer ſupported by the Column of Waters, did not fit itſelf exactly to the Aperture, ſo as to keep up the remaining Fluid in the Uterus, at leaſt in the Interval between the Pains.

There are two Cauſes which concur in procuring this Effect: the ſpecific Gravity of the Child's Body, which, alone, would precipitate it; and the Momentum it receives from the Violence of the Fluid in it's Eſcape.

Should any other Part than the Head preſent, the Aperture will not be ſo exactly filled as to prevent the eſcaping of the remaining Water; but it ſhould not be forgotten that we are deſcribing a natural Labour. The Child very often immediately follows the Diſcharge of the Waters; more frequently it requires a certain Number of Pains, ſuch as have been laſt deſcribed, ſome more, ſome leſs, each of which preſſes forward a Quantity of the Liquor contained in the Uterus, ſufficient, by lubricating, to relax the Parts, and to diſpoſe them to ſuffer Diſtenſion the more eaſily.

The Head having paſſed the Orifice of the Uterus, and being engaged in the Pelvis, does not recede, as it was deſcribed to do before the Burſting-forth of the Waters: It advances towards the Os externum in

a Manner

a Manner proportionate to the Degree of Force employed in propelling it.

When the Head has entirely paſſed the Orifice of the Uterus it gets into the Vagina. This mebranous Canal changes it's Dimenſion: It's Length is diminiſhed in a juſt Proportion to the Increaſe of it's Breadth. The Nymphæ and the Labia pudenda become effaced, ſo as to form but one Canal with the Vagina. The Perineum is diſtended and frequently lacerated. The Head is diſengaged, and the Reſt of the Body immediately follows with a Quantity of Water and Blood. In theſe laſt Moments the piercing Cries of the Mother ſhew the Pain to be moſt intenſe, and a Sort of convulſive Agitation is not uncommon.

State which ſucceeds the BIRTH.

The moſt immediate Tranſition from Pain to Pleaſure of which human Nature is capable preſents itſelf the Inſtant after the Birth. In the ſtrong Eaſtern Mode of Expreſſion, Fullneſs of Joy is ſignified in that of a Woman after Travail. The Ceſſation of Pain becomes the moſt exſtatic Pleaſure. The Tranſports of the Mother, in this State, are ſometimes ſo inordinate as to require, for her Safety, to be repreſſed by the Aſſiſtants. This Calm is in a ſhort Time interrupted by ſlight Pains, by whoſe Effect the Placenta, being detached from the Uterus is expelled, the Accoucheur generally aiding the Operation; and then, in the good Women's Phraſe, the Lady is ſaid to be ſafe.

Which is the principal Agent here.

This ſummary Deſcription of Labour is ſufficient to ſhew that, of all the Operations of Nature, there is none performed with ſo great an Apparatus, or which requires the Exertion of a greater Number of different Powers. There is however one amongſt them which is certainly the principal, and to which the others are ſubordinate. Whatſoever then will influence that Power, ſo as to determine it's Action, muſt be admitted to be the determining Cauſe of Labour. But, before we go in Search of the Cauſe, let us ſee upon what Ground we are to proceed to aſcertain the Nature of this principal Agent; for ſhould a Miſtake lie with Regard to that, we ſhall, very probably, be far to ſeek for the Cauſe. Touching this, a Fatality of Error ſeems to have impoſed itſelf upon all the antient Phyſiologiſts, and upon many of the Moderns, ariſing from the obvious Facility of aſcribing all to the Efforts of the Child: for as, upon the Rupture of the Waters, they found the Head immediately preſent itſelf at the Orifice of the Uterus, and as it were force it's Way thro' all Oppoſition, they did not heſitate to pronounce the Child the Agent by which the Whole was wrought. The Idea was ſimple and natural; they ſought no further. Error begets Error. Unanimous in their Choice of the Agent, it was neceſſary to explore the Cauſe that determined it's Action; and here again they fixed their whole Attention upon the Child. But in proſecuting the Enquiry, almoſt every Author has taken a different Road.

Opinion of the Antients.

The Antients, with their Oracle Hippocrates, believed that the Want of a ſufficient Quantity of Nouriſhment produced in the Child certain Senſations, which ſolicited him to make Efforts to be releas'd from his Priſon, to go in Search of Aliment elſewhere. This ſuppoſed Want muſt ariſe from one or other of the two following Cauſes: Either the Mother cannot produce Juices ſufficient for the Suſtenance of the Fœtus, or elſe the Juices being ſufficiently abundant are prevented by ſome Obſtacle from getting to him in the Proportion he requires. With regard to the firſt it is abſurd to ſuppoſe that the Juices can be deficient in young, healthy, full Women; for in general a Woman, after ſhe is brought to Bed, can ſupply Suck ſufficient for one, and often for two Children, and certainly a Child of nine or ten Months old conſumes by ſucking more of his Mother's Juices than he can be ſuppoſed to have done, while he was yet contained in the Womb: It follows then that if the Mother, without Difficulty, can furniſh to a greater Conſumption, ſhe may reaſonably be ſuppoſed to have ſufficient for one leſs conſiderable. If then the ſuppoſed Want of Nouriſhment does exiſt, it is not becauſe the Mother has not Juices ſufficient to ſupply it. The firſt of theſe pretended Cauſes being removed it is to be conſidered, whether the Want of Nouriſhment does not happen from this that the Juices, tho' ſufficient in the Mother's Body, find ſome Obſtacle either from the Uterus or Placenta, which prevents their paſſing to the Child in Quantity proportioned to his Need. What can be this Obſtacle? There is not a Doubt but at nine Months the Communication between the Placenta and Uterus is more ſolidly and better eſtabliſhed than at any other Period of Geſtation; for the Communication being kept up by the Anaſtamoſes of the Veſſels of thoſe Parts, it muſt be granted, that the greater the Surface by which the Uterus and Placenta are join'd, the more numerous will the Veſſels be; and every one knows that the Surface of thoſe Parts increaſes in Proportion to the Increaſe of the Magnitude of the Child, and that the Diameter of the Veſſels, by which the Communication ſubſiſts, increaſes in the very ſame Proportion. The Concluſion then is, that the Juices proper for the Child's Nouriſhment, ſupplied by the Mother, being in Quantity more than ſufficient, and no Obſtacle to prevent their paſſing to the Child, the Opinion muſt be falſe that at nine Months the Child, for Want of Nouriſhment, ſearches his Way into the World.

Acrimonie of the Liquor of the Amnios.

No leſs void of Reaſon is the Opinion of thoſe, who finding the laſt Syſtem not defenſible, have had Recourſe to the Acrimonie of the Liquor which ſurrounds the Fœtus; which, ſay they, producing a certain Irritation on the delicate Skin of the Child, determines him to make thoſe Efforts by which he is freed from the painful Impreſſion. The moſt ſuperficial Attention to the Nature of this Liquid would preclude the Neceſſity of combating this Theory; for in Fact it has all the Characters of Innocence and Sweetneſs. It reſembles not a little the Lymph, with regard to moſt of it's Qualities. But ſuppoſing it poſſeſſed of thoſe Principles of irritating Acrimonie, ſo laviſhly beſtowed upon it, I do not apprehend that the Body of the Fœtus would be thereby incommoded: The Epidermis, which covers the true Skin, was intended by Nature to defend it, and does in Fact prevent any diſagreeable Impreſſion upon it. Let any Quantity of Sea-Salt or Nitre be diſſolved in Water, the Effect of it upon the Skin of any Part of the Body will not differ from that produced by the pure Water alone, if they are cold in the ſame Degree: Nor will the Skin of the Fœtus be more ſenſible of the Impreſſion than that of an Adult; for, tho' it be thinner and more delicate, it has the particular Advantage of being covered with a Sort of greaſy Suet-like Subſtance, very fit to defend it from the Action of an irritating Fluid, even ſuppoſing the Waters charged with ſaline Particles. This Subſtance ſeems to be the Matter of the ſebacean Glands, which, as it is not miſcible with Water, is conſtrain'd to remain on the Surface of the Skin, and accumulating there for the Space of nine Months forms a plentiful Covering at the Time of the Birth. I cannot paſs over the Mention of this white greaſy Subſtance, with which the Bodies of almoſt all Infants come to the World beſmear'd, without admiring the Wiſdom of Providence, which is frequently moſt aſtoniſhing in Matters of ſeeming Simplicity. By an Artifice altogether eaſy and natural the Skin of the Fœtus is preſerved from the bad Conſequences that would attend a nine Months Maceration in warm Water, the Effect of which may be conceived from what we ſee every Day happen to Waſherwomen, on whoſe Hands the Scarf-ſkin becomes white, ſwells, forms Bliſters, burſts and often grows ulcerous; whilſt the Papillæ Nervoſæ always loſe their Senſibility. I fancy Nobody will heſitate to pronounce that an Operation, which makes ſo violent an Impreſſion on the Hands of an Adult, tho' continued but for the Space of a Day or two, would commit dreadful Ravage on the tender, delicate Skin of the Fœtus, who is conſtrain'd to endure it no leſs than nine Months: ſo that ſhould it be admitted, contrary to all Appearance of Truth, that the Liquor which ſurrounds the Child in the Uterus is endued with an irritating, ſharp Quality, it muſt nevertheleſs be equally confeſſed that the Child is guarded from every Poſſibility of it's Effect upon him; and of Conſequence the Syſtem, built upon the annoying Irritation of the Waters, falls to the Ground.

The Child incompaſſed in too narrow Bounds.

Bergerus form'd the Opinion that the Child, by his great Encreaſe, finding his Apartment too ſmall and himſelf thereby conſtrained, makes Uſe of thoſe Efforts in order to free himſelf from his Confinement. The Partiſans of this Syſtem, if they are not entirely ignorant of Hydroſtatics, have certainly forgotten that the Fœtus, during the whole Time he remains in the Uterus, is incloſed in a Globe of Waters ſurrounding him equally on all Sides, and is on that account as much at Eaſe the laſt Day of Geſtation as he was in the ſixth Month, notwithſtanding that the Increaſe of his Bulk is greater than the proportional Increaſe of the Dimenſion of the Cavity of the Uterus. The Preſſure upon him, as it can only proceed from the contractile or elaſtic Quality with which the Uterus is endued, will unqueſtionably be in Proportion to the Strength of the Uterus, and the Strength or contracting Power of the Uterus to that of the Thickneſs of its Sides; now the Sides of the Uterus being found, by every Day's Experience, to be pretty nearly of the ſame Thickneſs thro' every Period of Geſtation, it follows that the Fœtus is no more preſſed at the End than at the Beginning, and I believe there is No-body will doubt but at the latter Period he is better able to bear it, when Perfection hath given Firmneſs and Reſiſtance to his Parts. We may therefore reaſonably conclude, that the Preſſure of the Uterus upon the Fœtus being the ſame through every Period of Geſtation, and the Fœtus being in a better State to reſiſt the Force at the End than he is at any other Time, the Opinion that diſagreeable Senſations are raiſed in him, on Account of the Narrowneſs of the Cavity of the Uterus compared to his Bulk, is void of all rational Foundation.

Neceſſity of Breathing.

The Inſufficiency of every preceding Syſtem gave Riſe to the following, which is particularly ſupported by Peehlin and Bohn; that the Child, having arrived at the utmoſt Degree of Strength, Size and Perfection attainable in his Mother's Womb, found himſelf under the Neceſſity of breathing the Atmoſpherical Air, in order to exerciſe his Functions with Freedom.

Upon the Principles of this Theory it is very hard to conceive what it is that forces the Child to make his Appearance in the ſeventh or eighth Month, when his Mother and himſelf are in the moſt perfect Health: or in the Caſe where any Diſorder of the one or the other occaſions Labour and Delivery to come on, what is it that creates in the Child this irreſiſtible Deſire of breathing the open Air, never known to him before: ſurely it cannot be ſaid that without Reſpiration his Functions would ceaſe at that Period, in as much as, in the common Courſe of Things, they continue to be performed perfectly for two Months longer without the Aſſiſtance of the Air. It will not be found more reaſonable to ſuppoſe that his Deſire of breathing ariſes from the Exceſs of Heat in the Uterus at this particular Period; for how comes it that he is frequently delivered in the ſeventh Month? is the Heat already too great for him to bear? If ſo, how happens it that in general Children remain two Months longer than the ſeventh? but the Fact is that in the ninth Month the Degree of Heat in the Uterus is the ſame as at any other Time. There is no Practitioner who has not been frequently obliged to introduce his Hand into the Uterus, and I am convinced that on every ſuch Occaſion the Degree of Heat is found to be the ſame as in the Vagina or the Mouth: Should a Doubt ariſe about it the Thermometer, introduced immediately after the Expulſion of the Child, will be found to mark exactly the ſame Degree as it will if retained a conſiderable Time in the Mouth or Vagina of the ſame Perſon. It is therefore an Error to attribute to an increaſed Heat in the Uterus, the Uneaſineſs which is ſuppoſed to determine the Child to quit his Apartment in order to cool himſelf.

OTHER Advocates for the Neceſſity of breathing advanced, that at the Period of nine Months the Child's Body is increaſed ſo much, that the ſame Powers which operated the Circulation of the Blood to that Time are no longer ſufficient for the maintaining of it, and that this moſt important Function would therefore ceaſe did he not procure to himſelf ſome new Agent, more powerful than the former, for the Support of it. This Agent, ſay they, is the Air of the Atmoſphere. This is aſſigning an imaginary Cauſe to a real Effect. There does not appear any Reaſon to believe that at nine Months the ſanguinal Circulation in the Fœtus becomes feeble or languid. The Heart and the Arteries undoubtedly acquire Strength and Vigor in Proportion to the Increaſe of the other Parts of the Body: the relative Proportion between them is certainly the ſame at the End as it is at the Beginning of Geſtation. Beſides it is well known that after the Birth the Reſpiration becomes neceſſary meerly to forward to the Heart the Blood which paſſes at that Time through the Lungs, for it is no leſs certain that in the Fœtus the Blood does not paſs at all through the Lungs, but goes entirely by another Route; ſo that the Reſpiration cannot be neceſſary to maintain a Circulation from the Lungs to the Heart, before ſuch a Communication hath been ever eſtabliſhed. The Circulation of the Blood in the Fœtus goes on very pefectly, without the Aſſiſtance of the Reſpiration, in the ſame Manner it does in Fiſhes, and even in ſome Men with whom the Foramen ovale of the Heart and the arterial Canal remain pervious. We may therefore I think reaſonably conclude, that as the ſanguinal Circulation before the Birth has no Need of the Action of the Lungs for its Support, it is abſurd to advance that at nine Months the Fœtus neceſſarily ſeeks the Atmoſpheric Air in order to maintain it.

By

By the Meconium.

To the Weight and Acrimony of the Meconium others have attributed an Irritation, which ſolicited the Child to Movements, by which the Whole was ſuppoſed to be brought about. Drelincourt was the principal Champion of this Opinion; but of all Syſtems it is the weakeſt: ſo far is the Meconium from producing any Irritation either by its Weight or Acrimony that the Child generally remains a whole Day or more, after his Birth, before he goes to Stool, which is very irreconcileable to the Uneaſineſs ſuppoſed to ſolicit his Efforts. I have had frequent Opportunities of examining the Inteſtines of Children, who have died in coming to the World; there is nothing ſo rare as to find the Meconium in the Rectum, or even in the Colon: it is always contained in the ſmall Inteſtines, except in the Caſe where, the Child's Buttocks preſenting, its Abdomen is ſo compreſſed by the Uterus as to force forward the Meconium into the great Inteſtines, and even out at the Anus; but in natural Labours, where the Head preſents, what

Meconium there is will be always found in the leſſer Inteſtines; now every Body knows that the Uneaſineſs, which ſolicits the Diſcharge of the Stercoral Matter is felt upon the Sphincter Ani; ſo that as the Meconium in general does not get there it cannot poſſibly be ſuppoſed to irritate it, and the Syſtem ends in its firſt Principle.

It will hardly be found more reaſonable to ſuppoſe that as ripe Fruit tumble off the Tree, ſo does the Fœtus at the Period of Perfection; for in ſuch Caſe it is neceſſary that the Part by which he is attached to the Uterus ſhould be found dried up as the Stalk of the Fruit is when it falls off by Ripeneſs: the Placenta, on the contrary, is never ſo plump, full or ſo large as it is at the laſt Moment of Geſtation. Theſe are the principal Syſtems on the Theory of Labour, every one of which, it is clear, ſuffers unſurmountable Difficulties. It is really aſtoniſhing, that in ſo intereſting a Matter, Men of Knowledge and Sagacity ſhould continue to ſtumble over each other, by conſtantly treading the ſame Path; or that, warned by the Errors of others, ſome more judicious did not think of changing their

Courſe: for the Inſufficiency of each Hypotheſis giving Riſe to a new one, and this proving no more ſucceſsful than the former, it would appear obvious, one would think, that there muſt have been ſomething wrong in the Ground-work; and that they ſhould therefore, inſtead of multiplying Syſtems upon the old Plan, endeavour to inveſtigate the general Principle they had unanimouſly adopted. This would have detected the Error; but it ſeemed ſo natural to think that Labour was occaſioned by the Efforts of the Child that they never once doubted, and of Conſequence never ſought to prove it: yet I hope to ſhew, beyond even a Doubt, that no ſuch Quality does reſide in the Child.

Qualities neceſſary to the principal Agent.

THE ſlighteſt Retroſpect on the Phænomena of Labour will ſhew us that the principal Agent in this great Work ſhould be endued with theſe Qualities.

1ſt, THAT it be of ſuch a Nature as to exerciſe its Power in every Period of Geſtation, in as much as it cannot be denied that Labour and Delivery frequently happen in the ſecond, third, fourth, fifth, ſixth, ſeventh and eight Months; it muſt alſo be of ſuch a Nature that it's Power is exerted and it's Effect produced in the general at a Period pretty nearly the ſame with moſt Women; but as it is accelerated with ſome, ſo it may be retarded with others.

SURELY the Child has nothing like this. In the ſecond or third Month No-body will ſay that Perfection hath made it neceſſary for him to breathe the Atmoſpheric Air in order to maintain Circulation, or that at this Period he is in any Want of Aliment, or that he has already collected ſtercoral Matter ſufficient to produce Colicks; No-body will advance that at this Time his Apartment is too ſmall for him; nor will it be believed that he has already acquired Strength ſufficient to overcome the exceeding Reſiſtance of the Orifice of the Uterus, for ſo ill is he qualified for ſuch an Encounter that he is in general dead before he makes his Attack upon it.

2dly, This principal Agent muſt have, reſident in itſelf, the Power of leſſening the Capacity of the Uterus, ſo that whatever it contains will be thereby violently compreſs'd, and forced towards the Paſſage.

Can the Child be ſuppoſed capable of this? Will the moſt fertile Genius give him Qualities which will enable him to contract the Uterus in all Points, and leſſen the Dimenſion of it? Should Obſtinacy perſiſt in aſcribing ſuch a Power to a living Child, ſurely it will not extend to a dead one; yet I repeat it, and ſhall be obliged to do it frequently on Account of it's Importance, the Labour with a dead Child preſents the very ſame Phænomena as that with a living one. I may, therefore, preſume to aſſert that the Child is no more poſſeſſed of the ſecond Quality than of the firſt.

3dly, The principal Agent muſt have a Power of opening the Orifice of the Uterus by a moſt regular and gradual Dilatation. Of this too the Child has been ſuppoſed capable. The continued Preſſure by the Head on the Orifice of the Uterus being thought ſufficient at laſt to force it open.

It is not eaſy to conceive how this can happen, the exceeding Size of the Child's Head compared with the very ſmall Orifice of the Uterus; but to give it the faireſt Play, we will ſuppoſe the Child's Body a Segment of a Circle tending to form itſelf into a right Line. The Head, which is one Extremity of the Segment, acting with it's greateſt Force on the Orifice, it neceſſary follows that the Feet, which make the other Extremity of the Segment, will act upon the Fundus Uteri, as a Point, with a Violence proportionable to the Force employed on the Orifice by the Head, their Actions being in a contrary Senſe. The Fundus ſhould therefore aſcend during the Pain as much as the Orifice deſcends: The latter Effect however is very plain, the former not at all obſervable; on the contrary the Fundus, by applying the Hand on the Abdomen during the Pain, may be perceived to follow the Movement of the Neck of the Uterus. Beſide, I believe the Force neceſſary to mould the Head, in the Manner we frequently ſee it, to the Form of a diſtorted narrow Pelvis, would not fail to force the Feet thro' the Subſtance of the Uterus: A Rupture ſo fatal in it's Conſequences that fortunately it very rarely happens. The Situation of the Child is very frequently tranſverſe, his Head to one Side, his Feet to the oppoſite, with either his Back, his Belly, or a Side preſenting at the Orifice. If we ſuppoſe his Head and Feet to act in the Manner we have deſcribed, the Uterus will be diſtended from Right to Left, which can hardly be ſuppoſed capable of forcing the Orifice, yet we find the Dilatation go on, the Child thus ſituated, pretty much as when the Head preſents fair. The Buttocks, a Shoulder and other Parts frequently are protruded and locked in the Pelvis as firmly as the Head; can this be accounted for on the ſame Principles? But a little Attention to one particular Circumſtance would render all this Reaſoning unneceſſary, which is that at the Time the Dilatation is going forward in the moſt ample Manner, there is no Part of the Child in immediate Contact with the Orifice: The Waters alone advance in the Aperture, and the Body of the Child is raiſed upon the Column towards the Fundus Uteri. Will any Body ſay that, by retreating from it, the Child is capable of dilating the Orifice? But to finiſh upon a Point, to which I have really given more Attention than it merits, the Child has ſo little Share in procuring his own Delivery, that the Matter is accompliſhed with the ſame Facility when he is dead as when alive. Is a dead Child capable of Efforts? The Placenta can have no Power of Action; yet when by any Accident it remains in the Uterus, a new Labour comes on in a few Days and delivers it: As much may be ſaid of Moles, falſe Conceptions, or any extraneous Body contained in the Uterus. I may therefore I think conclude, that as the Child cannot be ſaid to poſſeſs a Power of contracting the Uterus, of dilating the Orifice, nor of forcing the Waters into it when dilated; that as every Thing goes on uniformly the ſame when he is dead as when alive, as well as it does when other inanimate Bodies, incapable of Action, are expelled from the Uterus, I ſay I may affirm that it is neither in the Child, nor in the other inanimate Bodies that we are to look for the Power to whoſe Action Labour and Delivery are due.

The Uterus the principal Agent.

The Uterus itſelf is the great Power, ſo much ſought after; by an elaſtic Quality, eſſential to it, it enters into Contraction; every Fibre of it exerting it's Force, and all tending as it were to a common Centre, whatever is contained in the Cavity of the Uterus becomes equally compreſſed almoſt on all Sides, and is neceſſarily forced to eſcape where there is leaſt Reſiſtance; that is by the Orifice which leads to the Vagina. The Action of the Uterus is, in the general, greatly aſſiſted by that of the Diaphragma and the abdominal Muſcles, whoſe Contraction leſſens the Capacity of the Abdomen, and thereby aids the Expulſion of any Thing contain'd in it. It requires not the Aſſiſtance of Phiſiology to be convinced of the Effect here attributed to the Action of the Diaphragma and of the abdominal Muſcles. When we go to Stool, or make Water, do we not, as it were by Inſtinct, after a long Inſpiration or Drawing up of the Air, retain our Breath 'till the Excrement is evacuated? This proves the Aſſiſtance we expect and get from the Action of the Diaphragma, and the Hand applied the ſame Inſtant on the Abdomen will leave no Room to doubt of the co-operating Exertion of the abdominal Muſcles. Their Action in procuring Delivery is the very ſame: by their Contraction the Capacity of the Abdomen is leſſen'd, the Uterus, the Rectum, the Bladder, and all the Viſcera of the lower Belly are violently compreſſed, and thereby get rid of their Contents the more eaſily. From the equal Exertion of this Contraction on all Things contained in the Abdomen we find it impoſſible to go to Stool without making Water alſo; and for the ſame Reaſon Women in Labour are ſolicited to the Diſcharge of both theſe Excrements, notwithſtanding their utmoſt Endeavours to prevent it, nay very often without their Knowledge: In ſhort, I believe it requires very little Argument to prove that the Contraction of the abdominal Muſcles aſſiſts in procuring Delivery.

THE Action of the Uterus itſelf is no leſs evident: let a Hand be applied on the upper Part of the Abdomen during the Pain, the Uterus will be found to grow harder, to recede, as it were to collect itſelf into a ſmaller Bulk, deſcending towards the Os Pubis. When in Practice there is a Neceſſity of introducing the Hand into the Cavity of the Uterus, either to turn the Child and deliver by the Feet when it preſents badly, or elſe to extract the Placenta when it remains by Accident, it is impoſſible not to be ſenſible of the Violence with which the Uterus contracts, inſomuch as frequently to benumb the Hand of the Operator, and deprive it entirely of the Power of acting. I have been very often obliged in ſuch Caſe to withdraw my Hand, in order to reſtore to the Muſcles their Strength, and perhaps to have repeated that Operation ſeveral Times before I have been able to accompliſh my Purpoſe, and upon ſuch reiterated Compreſſure have found the Muſcles of my Hand remain ſeveral Hours after in a State of Atonie. This I think proves, beyond a Doubt, that the Uterus not only contracts, but that it contracts moſt violently and irreſiſtibly. Some will perhaps object that a Contraction ſufficient to produce ſo great an Effect, as the Expulſion of the Child ſometimes is, cannot be expected from a thin membranous Bag ſuch as the gravid Uterus. It is there the Error lies. It has been ſuppoſed that the Increaſe of the Capacity of the Uterus was at the Expence of the Subſtance of it. That in Proportion to the Expanſion, the Subſtance of the Sides became thin and membranous, the Fibres loſing their Thickneſs by Extenſion; but there is nothing more falſe, the Subſtance of the Sides of the Uterus, except about the Orifice, remains pretty much the ſame through all Periods of Geſtation. This inexplicable Phænomenon was the general ſtumbling Block of Phyſiologiſts, how the Fibres came to be ſo enormouſly diſtended yet retain their Thickneſs! This was the Log that ſunk every Syſtem. The Examination of the Subſtance of the gravid Uterus leaves no Room to doubt but its Fibres are muſcular; indeed in the unimpregnated State it is not eaſy to determine the Nature of them; they are ſo cloſe that the Subſtance of the Uterus ſeems rather tendinous than muſcular: but it is quite different at the End of Geſtation; the State of it at that Period is as follows. On the internal Surface the Fibres are collected in Packets as on the Inſide of the Bladder. On the external Surface they form a plain, regular, uniform Expanſion: but whether on the outſide or within they are diſtinctly muſcular Fibres. The Packets on the internal

nal Surface do not all follow the ſame Direction. Some march in a ſtrait Line from the Fundus to the Neck, others obliquely, whilſt a third, very few in Number however, keep a horizontal Direction from one Side to the other. There is not more Similitude in the Diſpoſition of the muſcular Fibres of the Uterus and of thoſe of the Bladder, than there is in the Action of theſe two Viſcera. When the Bladder contracts, aided by the Action of the Diaphragma and the abdominal Muſcles, the Urine being compreſſed on all Sides is forced to eſcape where it finds leaſt Reſiſtance, that is by the Canal of the Urethra, and ſo great is the Violence with which it is ſhot forth, that it frequently overcomes the Reſiſtance of a Stone, confined in too narrow a Paſſage, and bears it away before it. Juſt ſo when the Uterus contracts, and calls for the Aſſiſtance of the Diaphragma and abdominal Muſcles whatever it contains is expelled. The Mechaniſm of both is perfectly the ſame. But however clearly we may have eſtabliſhed the poſitive determined Action of the Diaphragma and abdominal Muſcles in Labour, we muſt not fall into the Error of ſome, who, equally convinced with us of their Importance, have been willing to attribute to the Uterus only a ſecond, an under Part in the Work. There is no Doubt but the Uterus is the principal Agent, and the Contraction of the other two Powers meerly ſubordinate, of very great Utility indeed, but without which the End would be procured by the Action of the Uterus alone. When the Woman gives Warning of the Approach of the Pain, apply your Hand on the Abdomen, you will find the Uterus a conſiderable Time in Contraction before the Muſcles take the Alarm; but what renders the Matter perfectly clear is this, that there are Numbers of Women who, to avoid the extreme Violence of Pain, keep the abdominal Muſcles and the Diaphragma relaxed, who, as the Phraſe is, don't aſſiſt their Pains, yet they are at length delivered by the Contraction of the Uterus alone. I think it is therefore certain that the Uterus is the principal Agent, the other two Powers very good Auxiliaries, without whoſe Aſſiſtance however the End would more ſlowly, but no leſs certainly be produced. Should any Doubt ſtill remain let any one conſider what happens in præternatural Labours, where it is neceſſary to turn the Child to deliver.

It is a conſtant Rule in Practiſe to ſeize the Interval between the Pains for the Operation. The Muſcles are at that Time in perfect Repoſe, and by directing the Woman not to exert any Force, they are kept in a relaxed, inactive State; yet all her Endeavours will not prevent the Contraction of the Uterus. On the operating Hand you will find the violent Compreſſure from the Uterus, whilſt with the other you may perceive the abdominal Muſcles in a State of Inaction.

The Phænomena of LABOUR explained.

The Queſtion of the principal Agent being ſettled, and the Uterus in Poſſeſſion of that important Charge, I will proceed to explore the Labyrinth by Means of this Clue, and endeavour to account for the Phænomena of this great and wonderful Work.

It is a Truth, which I believe No-body will controvert, that whenſoever the Fibres of any Part are diſtended to a certain Degree beyond their uſual Tone, the Animal, to whom they belong, proves the Senſation of what is called Pain; and that the Pain will be intenſe in Proportion to the Diſtraction the Fibres undergo, that is the nearer they approach to a State of Solution or Rupture.

The End to be procured by the Contraction of the Uterus is the Expulſion of an extraneous Body; this cannot poſſibly take Place without a Dilatation of the Orifice of the Uterus, and to that Dilatation is owing the great Pain of Labour: ſo that it is clear the Pain is the Conſequence of an Effect produced by the Contraction of the Uterus, for the Contraction of the Uterus is no more painful in itſelf than that of any other Muſcle; but the Diſtenſion, the Diſtraction, call it what you will, which the Fibres of the Orifice ſuffer in the Dilatation produces the Effect. The Cauſe of the Pain being eſtabliſhed it is clear that in the Beginning of Labour the Contraction being neither violent nor long, the Dilatation of the Orifice will be very little, the Pain conſequently ſlight, and of ſhort Duration. However ſlow the Dilatation goes on a Separation of the Subſtance of that Part of the Uterus immediately about the Orifice from the correſponding Part of the Chorion muſt take Place. The Anaſtomoſes of the Veſſels, by which theſe two Parts were joined, muſt be deſtroyed by the creeping up of that Part of the Uterus next the Orifice. This will be attended with an Extravaſation of the Lymph contained in thoſe Veſſels, which will flow out even to the Os externum, and being ſomewhat gelatinous is very fit to lubricate the Parts and prepare them for Diſtenſion; and if a ſmall Blood-veſſel ſhould be in the Number, this glairy Liquid will be tinged with Blood. The Pain being ſo very ſlight it is not to be wondered at that this Period is not attended with any remarkable Alteration in the animal Oeconomy. To account why the Belly appears leſs, and why the Woman finds herſelf more active immediately before Labour, it is neceſſary to eſtabliſh a few preparatory Principles. It is remarkable that Nature, in all her Operations, obſerves a certain regular, ſlow, moderate Deportment, inſomuch that the firſt Steps of the Goddeſs are of ſo light a Tread as not to leave even the Mark of fairy Footſteps, whereby the human Eye might trace her. *Natura non facit Saltus*. Her Gradations are ſo regularly progreſſive that her firſt Movements elude our Search. The firſt Certainty, for Example, we are able to eſtabliſh of a putrid Fermentation is when our olfactory Organs become ſenſible of a volatile Alkaleſcence, yet it is certain that at that Point of Time the Fermentation is very conſiderably advanced, although imperceptible to our blunt Faculties. The ſame might be ſaid of almoſt every Operation of Nature. There is great Reaſon to believe that before the Contraction of the Uterus has arrived to ſuch a Degree as to produce even the ſlight Pains of the firſt Period of Labour, it has already gone through many Degrees not obſervable, and that the Muſcles of the Abdomen, by its Solicitation, have undergone the ſame, which elaſtic Vibration is ſympathetically conveyed to the whole muſcular Syſtem, ſo that every Muſcle of the Frame becoming more active, ſtands as it were a Centinel ready for Command: the Woman conſequently finds herſelf lighter and more active; for the Weight ſhe carries is not increaſed, the Powers deſtined to ſupport it have an acquired Degree of Force. The Exertion of the Muſcles of the Abdomen, and the Efforts of the Uterus itſelf preſs it down towards the hypogaſtric Region, and the other Viſcera of the lower Belly being compreſſed into narrower Bounds, it is no Wonder the Woman appears leſs big.

It is not difficult to account for the Increaſe of Pain in the ſecond Period of Labour, if we recollect the Principles we have aleady eſtabliſhed, that the violent Dilatation of the Orifice, a Part endued with exceeding Senſibility, muſt cauſe great Diſtraction to the Fibres.

It may reaſonably be aſked by what Mechaniſm is this Dilatation performed, and what is the Agent which operates it? Two Cauſes concur in producing this Effect, the univerſal Contraction of the muſcular Fibres of the Uterus, and the Action of the Waters, collected in a ſpherical Bag, on the Orifice. The firſt of theſe acts in the following Manner; the perpendicular Fibres of the Uterus, which are more numerous than any other of the fleſhy or muſcular ones, ſhoot out from a common Centre in the Fundus Uteri, and terminate on the circumferential Edge of the Orifice. The Meeting of all theſe Packets, at the Fundus, in a Point led the great Ruyſch to believe this a radiate Muſcle,

cle, placed by Providence in this particular Spot (where he ſuppoſed the Placenta always to be ſituated) in order, as he imagined, by its Contraction to detach the Placenta after the Birth. Had this illuſtrious Anatomiſt been more practiſed in Midwifery he would have diſcovered that the Placenta has no certain Situation.

THIS Diſpoſition of the greateſt Part of the muſcular Fibres of the Uterus is admirable. The oblique Packets may be ſaid to act perfectly in Concert with the perpendicular ones, as they go from one Packet to another of the perpendicular Fibres in an oblique Direction, ſo that when they contract their Action undoubtedly is to aſſiſt that of the perpendicular ones: in ſhort when they all contract, their united Action ſerves either to bring down the Fundus towards the Orifice, or vice verſa. But in this Reſpect the Fundus has a notable Advantage over the other Point, for, as the Fibres of it ſuffer no Interruption, the Contraction of the muſcular Packets can only bring it down towards the Orifice, whilſt the ſame Action on the oppoſite Point, that is on the Orifice, is continually forming a Dilatation in a regular, uniform Manner, the Fibres terminating on every Point of the Circumference of the Orifice.

THE Action of the Waters on the Orifice is the ſecond Cauſe of the Dilatation. When the Contraction of the Uterus hath leſſened it's Capacity, that the Dilatation of the Orifice is begun, and that the Part of the Chorion, which immediately correſponds with the Orifice, is ſeparated from the Uterus, the Liquor in which the Child is contained being violently compreſs'd on all Sides, except where the Orifice is dilated, naturally flows where it finds leaſt Reſiſtance, and, carrying the detached Part of the Membranes before it, forms the ſpherical Bladder already deſcribed. The Membranes offer a gentle Reſiſtance to the Eſcaping of the Waters, which ſtill accumulating (as is the Nature of Fluids) where the Reſiſtance is leaſt, by a regular and gentle Action forces open the Orifice, ſeparating each Point of the Circumference from the one oppoſite to it. Thus by a gentle, gradual Inſinuation of a Liquid, as it were Drop by Drop, has Nature managed the Dilatation of the Orifice of the Uterus, a Part ſo ſuſceptible of Pain, of ſuch exquiſite Delicacy, that there is Reaſon to fear the Action of a hard Body upon it (were ſuch a Thing even always at Hand ſpherically formed, and ready to offer itſelf to the Orifice in the moſt advantageous Way) would frequently throw the Patient into Convulſions. We have ſometimes Occaſion to lament the Loſs of this ſecond Cauſe of Dilatation, where the Waters have broken early in Labour; the Affair is always tedious and fatiguing: and 'tis by the Action of this ſame Cauſe that we find the Dilatation go on as regularly when the Back, Belly, or any other Part of the Child preſents at the Orifice, as when the Head does.

THE Contraction of the muſcular Fibres ought certainly to be regarded as the principal Cauſe of the Dilatation, in as much as we find it will do the Work alone; beſide that the Gathering of the Waters may be looked upon as the Effect of the other Cauſe; however the Whole is admirable.

THE repeated Contraction of the Uterus leſſens it's Capacity, ſo that the Membranes, which before the Dilatation lined the Uterus every where, not being endued with the ſame Elaſticity as the Uterus is, remain in a flaccid State after their Separation from the Uterus, and thus, by their yielding to the Force of the accumulating Fluid, is form'd that huge Bag we ſometimes ſee before the Breaking of the Waters.

THE Waters burſting forth the Uterus comes into Contact with the Child in all Points, and forces it forward in a Manner very eaſily conceiv'd.

WHETHER the Child be dead or alive we ſee the Buſineſs will go on alike, for it cannot poſſibly influence the Contraction of the Uterus, nor that of the abdominal Muſcles.

NEED I explain how the Nymphæ, &c. become effaced and form one Canal with the Vagina? or how the Liquor is prevented from eſcaping entirely by the Child's Head. The ſame Cauſe, which effected the Separation of the Chorion from the Uterus, continuing to act after the Child is expelled will alſo procure the Separation of the Placenta.

IT may be aſked why the Cauſe, which occaſions the detaching the Chorion in all it's Extent from the Uterus, does not do the ſame by the Placenta. The Placenta is more firmly attached, and it is obſervable when the Labour has been long that the Placenta, in general, very quickly follows the Child, without any great Effort to aid it.

I BELIEVE there is hardly a Neceſſity to explain why the Urine comes away involuntarily from ſome in Labour, whilſt with others it is entirely ſuppreſſed. In the firſt Caſe the Head of the Child preſſes the Body of the Bladder; in the latter it obſtructs the Urethra.

THE Pain and benumb'd State of the Thigh is owing to the Compreſſure on the great Nerve which goes to that Part. Nor is it neceſſary to ſhew why the firſt Labour is generally more difficult than any of the ſucceeding ones. The principal Phænomena being explain'd, the Reſt will be found eaſy.

What it is which determines the Uterus to contract.

HAVING, I think, ſufficiently aſcertained the Nature of the principal Agent, it's Manner of acting, and having explained the Phænomena depending on it's Action, I will proceed to enquire into the Cauſe which determines it to act; and that unqueſtionably is a certain Irritation which the Uterus ſuffers, when the full Period of Geſtation is accompliſhed.

It is very well known that whenſoever the muſcular Fibres are irritated to a certain Degree they forthwith enter into a State of Contraction. The Uterus is compoſed of muſcular Fibres, and is therefore ſubject to the ſame Law.

In the Courſe of Geſtation whatſoever is capable of violently agitating, of bruiſing, wounding, or any other Way of inflaming the Uterus fails not to bring on Labour and cauſe a Miſcarriage. The Method frequently made Uſe of to quicken Labour by ſtimulating Clyſters (whoſe Effect is communicated from the Rectum to the Uterus) evidently proves the ſame; as does the Experiment of irritating the Orifice with the Nail of the fore Finger, which never fails to bring on the Pain; indeed the Preſence of the Hand, at any Time, during Labour, in the Uterus will increaſe the Contraction. In ſhort I believe Nobody will queſtion the Truth of the Aſſertion, that whatſoever ſerves to irritate the Uterus will ſolicit it to contract. The Queſtion then is, whence comes this Irritation, what is the Cauſe of it? Some pretend that at this Period the Child inverts his Poſition, that is his Head preponderating takes the Place of his Feet, and he is in a Situation perpendicular to the Horizon; his Feet to the Fundus, his Head applied immediately upon the Orifice. This weighty and hard Part of him, ſay they, in Contact with a Part of the Uterus, ſo capable of Irritation as the Orifice is admitted to be, muſt ſolicit the Uterus to contract.

This Hypotheſis fails in it's very Source. Every Child does not come the Head foremoſt; ſome preſent the Feet, ſome the Buttocks, others the Belly: theſe Parts cannot, by their Weight and Hardneſs, be ſuppoſed to ſolicit the Uterus to contract, no more than can a Fungus, a falſe Conception, &c. &c. yet the Uterus does contract on theſe Occaſions, and the Orifice is dilated as perfectly as when the Head preſents. Another Opinion, indeed more reaſonable than the laſt, is this. The gravid Uterus, at Term, is from ten to twelve Times as large as the unimpregnated. It's Fibres being therefore drawn out to ten or twelve Times their natural Length, however capable they are of Extenſion, cannot give *ad Infinitum*; being ſtrain'd therefore to the Top of their Bent, ſhould the Violence continue upon them they muſt be in Danger of Rupture; this conſtitutes the State of Irritation neceſſary to ſolicit the Contraction, by which they may remove the Cauſe of their Uneaſineſs.

NOBODY ſurely will believe that a Packet of muſcular Fibres can be drawn out to ten or twelve Times it's natural Length, without loſing Part of its Thickneſs and of it's Strength. When the Urine hath been retained too long, and that the Bladder becomes fuller than it ought to be, what is the Conſequence? A Paralyſis, an Atonie of the Bladder, attended with moſt dreadful Circumſtances. Yet the Uterus, whoſe muſcular Fibres ſuffer incomparably greater Diſtenſion, retains not only it's perfect Strength, but alſo its Thickneſs. I repeat it again, this is the moſt curious Phænomenon of Nature, on the Explanation of which one of it's greateſt Operations depends. How comes it that the Uterus, whoſe Fibres in an unimpregnated State are ſo denſe, ſo fine, as to render it difficult to determine the Nature of them, ſhould, by Diſtenſion, ſo change it's Subſtance (contrary to all Laws of Nature) that it's Fibres become thicker, ſtronger, and their Direction become eaſier to trace? Or whence is it that the Subſtance of the Uterus, notwithſtanding this enormous Diſtenſion, ſtill remains the ſame, except in the lower Segment about the Orifice, which Part in the unimpregnated State is almoſt a ſolid Maſs, equalling in Size one-third the Bulk of the whole Uterus?

It will not ſuffice to ſay that Providence ordered it thus, that this Maſs, the Neck of the Uterus, ſhould be a Rampart in the Beginning of Geſtation to prevent the Eſcape of the Fœtus before Maturity, and that having done its Office, it became thin at the laſt Period of Geſtation, in order to facilitate the Child's Eſcape. The Intention of Providence is clear, the Mechaniſm is what remains to be explained; to which End it will be neceſſary to have a juſt Idea of the Change the Uterus undergoes by Geſtation; to compare the gravid with the unimpregnated Uterus;

and above all Things to give Attention to the remarkable Change the Neck of it undergoes.

In examining the unimpregnated Uterus the firſt Thing that, I believe, attracts the Notice and Surprize of every Body is the Length and Thickneſs of the Neck; it equals at leaſt one third of the whole in Length, but the Proportion will not hold with Regard to the Thickneſs of it's Sides; in that Reſpect it's Advantage over the Body of the Uterus is infinitely greater. The Neck is almoſt ſolid: the Sides of it are only ſeparated by a narrow Paſſage, which will ſcarcely admit a Probe. On the Inſide of this Paſſage may be remarked two Bundles of white ſolid Fibres, one before, the other behind, exactly oppoſite to each other. One End of this Paſſage opens into the Cavity of the Uterus, the other into the Vagina. The Extremity of the Neck of the Uterus, which ends in the Vagina, is round and prominent, and is what is commonly called the Os Tincæ: it's Subſtance is exactly the ſame with that of the Body of the Uterus. This is what is worthy of Attention in the unimpregnated Uterus; let us take a View of the gravid one in the laſt Period of Geſtation.

The Neck is entirely effaced, ſo as to form with the Body of the Uterus one perfect Globe, exactly filled every where; the Os Tincæ gone; the circumferential Edge of the Orifice thin and membranous; of the white fibrous Bundles on each Side the Orifice there is no Trace. Nothing can undergo a more remarkable Change than the Uterus does in this Caſe. What is the Uſe of this exceeding thick Neck, what becomes of it at the End of Geſtation?

This Neck is made Uſe of by Nature as it were a Magazine or Store, wherein are laid up a Quantity of muſcular Fibres, ready to be called forth when Need is, in order to furniſh to the Expanſion of the Uterus. This Store is laid up ſo ſagaciouſly, in ſo juſt Proportion, that by the Time the Child is come to ſuch Maturity, as to be able to endure the Action of external Agents, the laſt of the Fibres, thus huſbanded up, is drawn out, no more are to be had, the Child continues to increaſe, the Magazine being exhauſted a Diſtenſion of all the Fibres of the Uterus is the Conſequence,

ſequence, that cauſes Irritation, and Irritation, Contraction. The Contraction being eſtabliſhed the Reſt follows. Labour then neceſſarily comes on whenſoever all the Fibres, which have been thus laid up in Reſerve in different Parts of the Uterus, particularly in the Neck are unraveled, (pardon the Expreſſion, and applied to the enlarging of the Capacity of the Uterus. As long as any of them remain, the Growth of the Child requires more Space, they are conſequently drawn out of their Zig-zag Couches, the Uterus is diſtended and there is no Irritation; for the unraveling ſimply of theſe Fibres will not cauſe any.

As this Magazine of Fibres may be greater with ſome Women than with others, the Neck of the Uterus being longer and thicker, and as ſome Children may poſſibly increaſe in Bulk quicker than others, it is eaſy to conceive why many Women may be naturally delivered before the Period of nine Months, whilſt others go beyond it; indeed it follows that there can poſſibly be no fixed Term, altho' Nature is pretty uniform with Regard to the Matter.

In order to give the beſt Idea in my Power of this progreſſive Unraveling of the Fibres, (I muſt ſtill uſe this aukward Word, as I know no other that conveys the Meaning ſo well,) I will endeavour to follow the Uterus, in the Progreſs of it's Expanſion, as regularly as I can.

In the firſt Weeks after Conception the Cavity of the Uterus is very little changed from what it is in the unimpregnated State; it is more than ſufficient to contain the Embryo with it's Appendages, and ſtill retains it's triangular Form, the Angles extremely acute, and the Sides coming ſo cloſe together as to leave but a very narrow, flat Space between them. Had the Place deſtined for the Reception of the Embryo been formed large enough to contain the Fœtus at full Growth, how uncertain would it's Deſtiny be on its firſt Entry! when it became neceſſary for it's Suſtenance and Well-being that it ſhould immediately take Root, in order to be nouriſh'd, it might have floated in this World of Space, God knows how long, ſhook by every Movement of the Mother, and ſubject, after it's Attachment, to be again ſet a wandering, were it not ſupported,

ported, kept firm in it's Situation by the Sides of the Uterus, in immediate Contact with it almoſt every where. There is nothing in Nature more admirable than this Contrivance, except the Means by which the Uterus finds in itſelf wherewith to furniſh to it's own Expanſion, in Proportion as the Child grows. There are here and there, on the internal Surface of the Body of the Uterus, little Inequalities, which entirely diſappear before the End of the fifth Month, and there is Reaſon to believe that the Effacing of theſe little Lumps goes on in a regular, uniform Manner from the firſt fifteen Days to the End of the fifth Month; for the Cavity of the Uterus is all the Time gradually increaſing, yet the Neck has not yet loſt a Fibre, it's Length and Thickneſs remain entire. Theſe little Inequalities or Lumps are nothing elſe than ſo many little Magazines deſtined to furniſh to the gradual Expanſion of the Uterus to the ſixth Month, leaving the Neck, which we before remarked to be a Rampart againſt the premature Eſcape of the Child, in it's entire and perfect Force: ſo that up to the Beginning of the ſixth Month the Cavity of the Uterus is gradually changing not only

it's

it's Capacity, but alſo it's Form, from triangular to eliptical.

In the Beginning of Geſtation the Blood, which would have been diſcharged by the Menſes, being in greater Quantity than the Embryo has Need of, remains in the Subſtance of the Uterus, renders it leſs compact, leſs denſe, and, by relaxing the muſcular Fibres, fits them for being the more eaſily unraveled; for the Manner in which I ſuppoſe theſe Fibres to be laid up in the Magazine reſembles not a little the Zig-zag of the Sleeve of a Shirt, by which it is folded under the Wriſt-band. The Metaphor may appear vulgar and familiar, but Perſpicuity is what I ~~am~~ aim at.

Nature has made Uſe of the ſame Stratagem in other Places beſide the Uterus. What is the Uſe of the Nymphæ and of the many other Folds remarkable in the Vagina? Are they not all effaced, in the Birth, furniſhing to the Expanſion of that great Canal, into which the Vagina is ſtretched?

When the Child's Increaſe hath demanded all the Fibres folded up in the different Parts of the Body of the Uterus, which is completed about the End of the fifth Month, and that he ſtill continues to grow, there is Need of more Space; then does the Neck of the Uterus begin to furniſh, and this goes on by the moſt regular Degrees 'till the whole Magazine is exhauſted; the Child does not ceaſe to augment in Size, the Fibres of the Uterus every where are diſtended in ſuch a Manner as to bring on the Irritation or Diſtraction neceſſary to determine them to contract. There is nothing perhaps gives ſtronger Evidence of the Truth of this Theory than the Caſe of Twins. Roedrer, who is certainly the beſt modern Writer on the Elements of Midwifery, has the following Obſervation: "Evenit inde ut "Gemelli minoris Molis ſint ac unicus "Fœtus alio Tempore ab eadem Matre "in Lucem editus. Sæpius etiam iſta "minor Proportio propter præmaturam "Excleſionom ulterius imminuitur."

Exclusione

THERE is no Doubt but that, in general, Twins come a Month or ſix Weeks before the ordinary Courſe of Geſtation, that each Child is leſs than Children commonly are at nine Months, and that the Liquor ſurrounding both is commonly in leſs Quantity than it is with one; ſo that upon the whole the total Maſs in the Courſe of the eighth Month equals that of the other at nine: The Fibres of the Neck are therefore all called forth by that Time, no more are to be had, and Labour is the Conſequence.

I SHALL not pretend to urge, in Defence of this Syſtem (which certainly is new, and the ſole Property of the ingenious and worthy Phyſician, to whom in the Beginning of this Eſſay I gave the Honour of it) any Thing further, but what he himſelf ſays of it, and I will give it in his own Words: "If, ſays he, to be entirely convinced of the Truth of what "one aſſerts were as likely to carry Perſuaſion with it in Queſtions of philoſophical Enquiry, as it frequently does "in meer Matter of Opinion, I ſhould "have no Doubt that I had ſatisfied all "my Readers."

FINIS.

Corrigenda in primo Faſciculo.

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